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FULL CONTENTS CLAIM + DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART TECHNICAL PROBLEM DESCRIPTION OF DRAWINGS DRAWINGS

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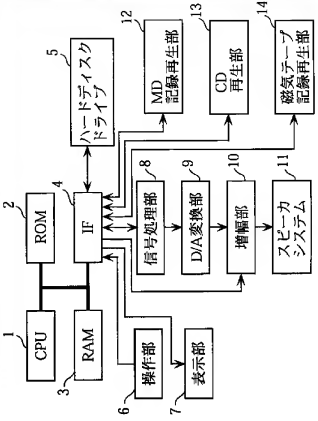
FULL CONTENTS

[Claim(s)]
[Claim 1]Are a recorded message sender for telephone which carries out record reproduction of the digital musical piece data by a recording reproduction section at a disc-like recording medium, and said recording reproduction section is controlled at the time of record, When a non-record section exists in a recording track in said recording medium, A recorded message sender for telephone provided with a record reproduction control part to which operation of carrying out overwrite record one by one from the start edge of a recording track to a termination will be made to perform cyclically if it is made to record one by one towards the termination side from the recording track start edge side of the non-record section and a non-record section stops existing.
[Claim 2]A recording track in said recording medium is divided by many sectors from the start edge to a termination, and, [said record reproduction control part] A sector of a continuous predetermined number which contains a sector of the start edge or a sector of the start edge by controlling said recording reproduction section is made into a management field, Management information required for the management field for record of musical piece data covering said whole recording medium and/or reproduction is made to record, The recorded message sender for telephone according to claim 1 on which header information required for the header field for record of the musical piece and/or reproduction is made to record by making into a header field a sector of a continuous predetermined number which contains a sector of a head of each musical piece, or a top sector among sectors other than said management field.
[Claim 3]The recorded message sender for telephone according to claim 2 on which sector attribute information that it is expressed whether said

Drawing selection: Representative draw



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record reproduction control part is the sector with which whether the sector concerned being a sector of a header field and musical piece data were recorded at a head portion of all the sectors other than said management field by controlling said recording reproduction section is made to record.
[Claim 4][said record reproduction control part] [at the time of record] [by controlling said recording reproduction section] The recorded message sender for telephone according to claim 2 or 3 reproduced sequentially from the new musical piece of record time by making the newest record position information for judging a sector number of a musical piece recorded on the newest record on said management field, and controlling said recording reproduction section at the time of reproduction.
[Claim 5][said record reproduction control part] [based on directions operation by a user] [by controlling said recording reproduction section] [by making reproduction prohibition information that it means not reproducing the musical piece at the time of reproduction record on a header field of a musical piece specified by user, and controlling said recording reproduction section at the time of reproduction] The recorded message sender for telephone according to any one of claims 2 to 4 which does not reproduce a musical piece by which said reproduction prohibition information is recorded on a header field.
[Claim 6]The recorded message sender for telephone according to any one of claims 1 to 5 which said record reproduction control part interrupts [recorded message sender for telephone] reproduction of a musical piece under present reproduction by controlling said recording reproduction section based on directions operation by a user at the time of reproduction, and makes reproduction of the following musical piece start.
[Claim 7]The recorded message sender for telephone according to any one of claims 1 to 6 in which said record reproduction control part determines a reproduction order of a musical piece at random based on directions operation by a user at the time of reproduction.

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the recorded message sender for telephone which carries out record reproduction of the digital musical piece data by a recording reproduction section at a disc-like recording medium.
[0002]
[Description of the Prior Art]The number of music which can record common recorded message senders for telephone, such as a cassette deck, MD deck, or a CD deck, to one media is about about ten music at the maximum.
Prolonged recording was not made.

[0003]Although using a hard disk on the other hand as a recording medium which stores musical piece data is proposed, The number of music In this case, although a large number are storable with thousands of music unit, since [for example,] it aims at storage of musical piece data to the last, A "music name", an "artist name", etc. for managing it may have been needed, and the input interface, the search system at the time of reproduction, etc. may have become complicated.
[0004]Since the FAT form currently used with the personal computer etc. as a data storage method is adopted, When data is deleted, fragmentation of a sector occurs, if new data is written in so that it may be complemented, seek

operations will occur frequently at the time of reproduction of a musical piece, and noise will occur.
[0005]
[Problem to be solved by the invention]Thus, in the above-mentioned conventional recorded message sender for telephone, if it was in the thing in which prolonged recording is possible with one recording medium, SUBJECT that management of a musical piece was complicated and noise was made by seek operation occurred.
[0006]This invention is invented under such circumstances, and management of a musical piece is easy and makes it the SUBJECT to provide the recorded message sender for telephone which can reduce the noise by seek operation good.
[0007]
[Description of the Invention]In order to solve above-mentioned SUBJECT, the following technical means are provided in this invention.
[0008]According to the 1st side of this invention, are a recorded message sender for telephone which carries out record reproduction of the digital musical piece data by a recording reproduction section at a disc-like recording medium, and a recording reproduction section is controlled at the time of record, When a non-record section exists in the recording track in a recording medium, If it is made to record one by one towards the termination side from the recording track start edge side of the non-record section and a non-record section stops existing, the recorded message sender for telephone provided with the record reproduction control part to which operation of carrying out overwrite record one by one from the start edge of a recording track to a termination is made to perform cyclically is provided.
[0009]According to other desirable embodiments, [the recording track in a recording medium] It is divided by many sectors from the start edge to the termination, and, [a record reproduction control part] The sector of the continuous predetermined number which contains the sector of the start edge or the sector of the start edge by controlling a recording reproduction section is made into a management field, Management information required for the management field for the record of musical piece data covering the whole recording medium and/or reproduction is made to record, Header information required for the header field for record of the musical piece and/or reproduction is made to record by making into a header field the sector of the continuous predetermined number which contains the sector of the head of each musical piece, or a top sector among sectors other than a management field.
[0010]According to other desirable embodiments, the sector attribute information that it is expressed whether a record reproduction control part is the sector by which musical piece data was recorded [whether the sector concerned is a sector of a header field and] on the head portion of all the sectors except a management field by controlling a recording reproduction section is made to record.
[0011]According to other desirable embodiments, [a record reproduction control part] It is made to reproduce sequentially from the new musical piece of record time by controlling a recording reproduction section by making the newest record position information for judging the sector number of the musical piece recorded on the newest record on a management field, and controlling a recording reproduction section at the time of reproduction at the time of record.
[0012]According to other desirable embodiments, [a record reproduction control part] [based on the directions operation by a user] [by controlling

a recording reproduction section] The musical piece by which reproduction prohibition information is recorded on the header field is not reproduced by making the reproduction prohibition information that it means not reproducing the musical piece at the time of reproduction record on the header field of a musical piece specified by the user, and controlling a recording reproduction section at the time of reproduction.
[0013]According to other desirable embodiments, a record reproduction control part interrupts reproduction of the musical piece under present reproduction, and makes reproduction of the following musical piece start by controlling a recording reproduction section based on the directions operation by a user at the time of reproduction.
[0014]According to other desirable embodiments, a record reproduction control part determines a reproduction order of a musical piece at random based on the directions operation by a user at the time of reproduction.
[0015]When according to this invention a record reproduction control part controls a recording reproduction section at the time of record and a non-record section exists in the recording track in a recording medium, Since operation of carrying out overwrite record one by one from the start edge of a recording track to a termination will be made to perform cyclically if it is made to record one by one towards the termination side from the recording track start edge side of the non-record section and a non-record section stops existing, Since fragmentation of a sector is not produced, management of a musical piece is easy and can reduce the noise by seek operation good.
[0016]The other features and advantages of this invention will become clearer by detailed explanation given to below with reference to an accompanying drawing.
[0017]
[Mode for carrying out the invention]Hereafter, the desirable embodiment of this invention is concretely described with reference to Drawings.
[0018]Drawing 1 is a circuit block diagram of the audio system which adopted the recorded message sender for telephone concerning this invention. [this audio system] It has CPU1, ROM2, RAM3, the interface circuit 4, the hard disk drive 5, the control unit 6, the indicator 7, the signal processing part 8, the D/A conversion part 9, the amplifying unit 10, the speaker system 11, the MD recording reproduction section 12, CD reproduction part 13, and the magnetic tape recording reproduction section 14.
[0019]CPU(central processing unit) 1 controls the whole audio system.
[0020]ROM(read only memory) 2 has memorized a program for operating CPU1, etc.
[0021]RAM(random access memory) 3 provides CPU1 with a work area, and it memorizes various kinds of data.
[0022]The interface circuit 4 controls communication between CPU1 and various kinds of peripheral circuits, such as the hard disk drive 5.
[0023]The hard disk drive 5 is controlled by CPU1, and writes data of musical piece data etc. in a built-in hard disk, and reads musical piece data etc. from a hard disk.
[0024]The control unit 6 is provided with two or more key switches which are operated by user, and supplies a manipulate signal according to a user's operation to CPU1.
[0025]The indicator 7 is controlled by CPU1 and displays guidance of operation, a situation of a device of operation, etc. on a display screen.
[0026]The signal processing part 8 performs processing of digital signals, such as extension of musical piece data.
[0027]The D/A conversion part 9 changes into musical composition signals

of an analog musical piece data elongated by the signal processing part 8.
[0028]The amplifying unit 10 is controlled by CPU1 and amplifies musical composition signals from the D/A conversion part 9.
[0029]The speaker system 11 is provided with two or more loudspeakers, and changes musical composition signals from the amplifying unit 10 into audible frequency.
[0030]The MD recording reproduction section 12 is controlled by CPU1, and reads musical piece data from MD (mini disc), and writes musical piece data in MD.
[0031]CD reproduction part 13 is controlled by CPU1, and reads musical piece data from CD (compact disc).
[0032]The magnetic tape recording reproduction section 14 is controlled by CPU1, and reads musical piece data from magnetic tape, and writes musical piece data in magnetic tape.
[0033]Drawing 2 is a conceptual explanatory view of a recording track in a hard disk. A recording track of a hard disk is divided into many sectors from the start edge to a termination, and a number is attached like 0, 1, 2, and - sequentially from a sector of the start edge.
[0034]The sector 0 is always used as a management field, and musical piece data is not written in. Management information required for record of musical piece data and playback covering the whole hard disk is stored in a management field. As management information, a sector number which should start record next, a sector number of a header field corresponding to a musical piece which was being reproduced last time, etc. exist, for example.
[0035]The sector 1 or subsequent ones is assigned to each musical piece, and the numbers of sectors which each musical piece uses differ according to the quantity of musical piece data. The sector of the head of each musical piece is used as a header field.
[0036]Header information is recorded on a header field. As header information, the sector number of the header field concerned, a header number, a delete mark, the sector number of the header field of a front musical piece, the sector number of the header field of the following musical piece, the size of the musical piece data of the musical piece concerned, a storing data format, etc. exist, for example. A delete mark is the reproduction prohibition information for expressing directions of not reproducing the musical piece concerned at the time of reproduction.
[0037]Musical piece data is stored from the next sector of a header field for every musical piece. Since the size of musical piece data is stored in the header field, the last sector of a musical piece can be grasped from the size.
[0038]The head part fraction byte (for example, about 2 bytes) of all the sectors except a management field is used as a sector attribute field like a header field for every musical piece. in this sector attribute field, this sector is a data sector -- or the sector attribute information which shows whether it is a header sector is stored. This sector attribute information is used, in order that the sector which was a header field before may change to a musical piece data area and may judge it, while carrying out overwrite record.
[0039]Next, operation is explained.
[0040]For example, a user operates the control unit 6, chooses MD as a candidate for playback, chooses a hard disk as a candidate for recording and starts recording to record the musical piece recorded on MD to a hard disk.
[0041]Thereby, CPU1 controls the MD recording reproduction section 12, and it reproduces MD. The musical piece data from the MD recording reproduction section 12 is stored in a hard disk by the hard disk drive 5. At

this time, the hard disk drive 5 is controlled by CPU1. RAM3 is used as a buffer memory.

[0042]When a non-record section exists in a hard disk, record is started from the head of the non-record section. For example, when one musical piece is not recorded by the hard disk, either, header information is recorded on the sector 2 and musical piece data is recorded from the sector 3.

[0043]When a non-record section does not exist in a hard disk, the oldest musical piece is deleted and a new musical piece is recorded.Specifically, overwrite record of the header information and musical piece data about a new musical piece is carried out. For example, when used to the last sector of a hard disk by the front musical piece, the header information of a new musical piece is overwritten at the sector 1, and the musical piece data of a new musical piece is overwritten after the sector 2. Of course, according to the size of the musical piece data of a new musical piece, even the sector in the middle of the original musical piece may be overwritten, and even the last sector in the middle of the following musical piece may be overwritten, without being insufficient only by the original musical piece.

[0044]When a new musical piece is recorded, a track number is shaken sequentially from the newest thing, and it is recorded on a management field. A track number here is a tune number item of a musical piece.

[0045]That is, as recording operation, from the sector 1 to the last sector is used cyclically one by one, and this order is not changed. Therefore, after the user does not need to be conscious of the capacity of a hard disk and a non-record section is lost to a hard disk, the oldest musical piece will replace the newest musical piece. CPU1 determines whether to start the recording of a new musical piece from which sector with reference to the management information on a management field.

[0046]The above recording operation is also completely the same as when recording the musical piece data from CD reproduction part 13 or the magnetic tape recording reproduction section 14, although it explained the case where the musical piece data from the MD recording reproduction section 12 was recorded.

[0047]When a user operates the control unit 6, chooses a hard disk and directs playback, CPU1 controls the hard disk drive 5 and it makes it play one by one sequentially from the musical piece recorded most these days. At this time, CPU1 judges the storing position of the musical piece recorded most these days with reference to the management information on a management field. Since the sector number of those header fields is stored in the header field of each musical piece as header information about the musical piece in front of [of the musical piece concerned] one, and the musical piece after one, CPU1 can judge the reproduction starting position of the musical piece of order by referring to header information.

[0048]The signal processing part 8 develops, and the musical piece data read from the hard disk drive 5 is changed into the musical composition signals of an analog by the D/A conversion part 9, is amplified by the amplifying unit 10, and is outputted from the speaker system 11. The tone control circuit is built in the amplifying unit 10, and when CPU1 controls the amplifying unit 10, it is adjusted to the sound quality according to a user's setup.

[0049]When a user operates the control unit 6 and directs a skip during playback, CPU1 controls the hard disk drive 5, it stops playback of the present musical piece, and makes playback of the following musical piece start.

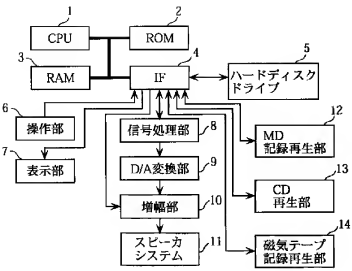
[0050]If a user operates the control unit 6 and directs random playback, CPU1 will determine a playback order of a musical piece at random, and it

will reproduce a musical piece to the hard disk drive 5 in the order.
[0051]If a user operates the control unit 6 and directs elimination during reproduction, CPU1 will record a delete mark on the header field of the musical piece under reproduction. Thereby, it is not played at the time of the playback on and after next time, and the musical piece concerned brings the same result for a user to have been eliminated from the hard disk. However, it is recorded on a hard disk until it is not eliminated in fact but overwrite is performed at the time of record.
[0052]When [thus,] CPU1 controls the hard disk drive 5 and a non-record section exists in a recording track in a hard disk at the time of record, Since operation of carrying out overwrite record one by one from the start edge of a recording track to a termination will be made to perform cyclically if it is made to record one by one towards the termination side from the recording track start edge side of the non-record section and a non-record section stops existing, Since fragmentation of a sector does not occur, generating of noise resulting from seek operation at the time of reproduction is mitigable good.
[0053]The user does not need to be fundamentally conscious of deletion of a musical piece. Namely, since a musical piece recorded becomes a huge quantity when a hard disk is used, When remaining capacity of a hard disk has been lost and it has composition which a user specifies a musical piece and performs deletion operation in order to record a new musical piece, While the user needs to carry out from specific operation of a musical piece to delete and operation will become very troublesome, a program for it will also become complicated. however, if overwrite elimination is made to be carried out automatically like this embodiment from a musical piece recorded on earliest, the user does not need to perform any operation, either, and user-friendliness will be markedly alike and will improve.
[0054]And a user can be provided with the same effect as deletion of a musical piece, preventing fragmentation of a sector, since an elimination mark as reproduction prohibition information was written in a header field, and it constituted henceforth based on a user's directions so that the musical piece concerned might not be reproduced.
[0055]Prolonged continuation playback can be performed without exchanging recording media, since a hard disk was used as a recording medium. This is very effective when using it, for example as BGM.
[0056]It is necessary to manage neither a music name nor an artist name. That is, positioning of a device is used as an interim storage device of a musical piece, and it is not dared to adopt a complicated data control method, but since it was made to play one by one from a musical piece only recorded to the newest, an input interface for a user to do the selection directions of a "music name" and the "artist name" becomes unnecessary. Thereby, operation becomes easy and a user's user-friendliness improves. Since it has functions comparable as the conventional CD player, such as random reproduction and a skip in every music, a user does not feel inconvenience.
[0057]Since positioning of a device is an interim storage device of a musical piece to the last and it is thought that a user keeps master data by another media etc., even if it is a case where crash of a hard disk occurs, it is thought that influence which it has on a user will become restrictive.
[0058]In the above-mentioned embodiment, although a hard disk was used as a disc-like recording medium, other recording media, such as not only a hard disk but DVD in which record playback is possible, may be used. However, a recording medium as much as possible with big capacity is preferred.

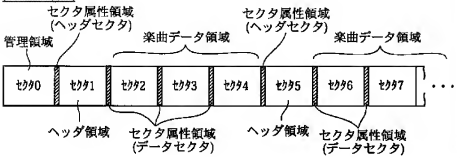
[0059]In the above-mentioned embodiment, although the management field and the header field of each musical piece were made into one sector, respectively, two or more sectors may be used.
[0060]Although the case where digital musical piece data was supplied from the MD recording reproduction section 12, CD reproduction part 13, and the magnetic tape recording reproduction section 14 was explained in the above-mentioned embodiment, What is necessary is to provide the A-D converter which changes the musical composition signals into digital data, and the compressor which compresses the digital data changed by the A-D converter in the form of predetermined, and just to store in a hard disk the musical piece data compressed with the compressor, when the musical composition signals of an analog are supplied.
[0061]In the above-mentioned embodiment, it constituted so that it might usually play one by one from the musical piece recorded to the newest at the time of playback, but it may constitute so that it may play one by one from the musical piece recorded to earliest.

[Brief Description of the Drawings]
[Drawing 1]It is a circuit block diagram of the audio system which adopted the recorded message sender for telephone concerning this invention.
[Drawing 2]It is a conceptual explanatory view of the recording track in a hard disk.
[Explanations of letters or numerals]
1 CPU
2 ROM
3 RAM
4 Interface circuit
5 Hard disk drive
6 Control unit
7 Indicator
8 Signal processing part
9 D/A conversion part
10 Amplifying unit
11 Speaker system
12 MD recording reproduction section
13 CD reproduction part
14 Magnetic tape recording reproduction section

[Drawing 1]



[Drawing 2]



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